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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,489	09/02/2003	In-Su Hwang	1349.1259	2307
21171	7590	01/26/2005	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			MRUK, GEOFFREY S	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/652,489		HWANG, IN-SU	
	Examiner		Art Unit	
	Geoffrey Mruk		2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

a) The specification states, "The life spans of the luminous products, thus, are specified according to options of the products using the luminous product. And a brightness thereof may reach beyond 5,000L and may further increase by 250% using additional conventional reflecting paint" (paragraph 30).

A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter.

b) The unit of measure 5,000L is incorrect, as "L" is not the correct unit for brightness. The Examiner suggests changing the unit of measure to 5,000lm, as "lm" is the unit for lumens.

Appropriate correction is required.

Claim Objections

Claim 1 is objected to because of the following informalities:

Claim 1 states, "a supporting member disposed at a predetermined position to detect when an ink level is decreased below a predetermined level".

- The supporting member does not detect the ink level.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 6, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (US 5,689,290).

With respect to claim 1, Saito discloses an ink detecting device (Fig.3) of an inkjet printer (Fig.1), comprising:

- an ink tank (Fig.3, element 11) comprising a predetermined amount of ink (Column 5, lines 32-48);
- a supporting member disposed at a predetermined position to detect when an ink level is decreased below a predetermined level. Although the supporting member is not disclosed to support the light emitting diode (Fig.3, element 34), this supporting member would necessarily be present to hold the light emitting diode.
- a luminous member (Fig.3, element 34) comprising a self-luminous material and supported by the supporting member; and
- a photo detector (Fig.3, element 35) to detect a light (Fig.3, element C) emitted from the luminous member when the ink level in the ink tank is lower than the predetermined level.

With respect to claim 2, Saito discloses a transparent window (Fig.3, elements 30 and 31) disposed at a corresponding position of the supporting member to pass the light (Fig.3, element C) from the luminous member (Fig.3, element 34), wherein the photo detector detects (Fig.3, element 35) the light passed through the transparent window.

With respect to claim 5, Saito discloses the supporting member is disposed at a sidewall (Fig.3, element 22) of the ink tank (Fig.3, element 11). Although the supporting member is not disclosed to support the light emitting diode (Fig.3, element 34), this supporting member would necessarily be present to hold the light emitting diode.

With respect to claim 6, Saito discloses the supporting member is disposed at a bottom (Fig.3, element 22) of the ink tank (Fig.3, element 11). Since the diode (Fig.3, element 34) is disposed at a bottom of the tank, the support for the diode would necessarily be present at the bottom of the tank.

With respect to claim 14, Saito discloses an ink detecting device (Fig.3) of an inkjet printer (Fig.1) comprising:

- a luminous member (Fig.3, element 34) comprising a self-luminous material to detect when a level of ink is lower than a predetermined level during a printing operation (Column 5, lines 31-48).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, 7-13, and 15 are rejected under 35 U.S.C. 103 as being obvious over Saito (US 5,689,290) in view of Wirthlin (Pub. US 2001/0022342 A1).

With respect to claim 10, Saito discloses an ink tank comprising a liquid carrier and toner used as a developer for the inkjet printer. The toner would necessarily be present in the liquid carrier since ink has carrier and colorant.

With respect to claim 12, Saito discloses when the tank is not full the light emitted from the luminous member passes through the transparent window.

With respect to claim 13, Saito discloses a liquid carrier and a toner used as a developer for the inkjet printer. Although the toner is not disclosed, the toner would necessarily be present in the liquid carrier since ink has carrier and colorant. Additionally, Saito discloses a supporting member disposed at the bottom of the ink tank to detect when the ink is low, a transparent window passing a light from the luminous member and disposed at a sidewall of the ink tank, and a photo detector detecting the light from the luminous member.

Saito does not disclose:

With respect to claim 3, Saito does not disclose a luminous member is a luminous paper.

With respect to claim 4, Saito does not disclose a luminous member is a luminous paint.

With respect to claim 7, Saito does not disclose a luminous member comprising a self-luminous material or a material with fluorescent or luminous paints to detect when a level of ink is lower than a predetermined level during a printing operation without a separate light source.

With respect to claim 11, Saito does not disclose when the ink tank is full, the light emitted from the luminous member cannot pass through the transparent window, and the photo detector cannot detect any light.

With respect to claim 15, Saito does not disclose the luminous paper that is disposed at a predetermined position of an ink tank to detect whether the ink is lower than the predetermined level using a light emitted therefrom.

Regarding claims 3, 4, 7, and 15, Wirthlin discloses a liquid level sensor where, "The light source 54 may be in the form of one or more fluorescent lights, incandescent bulbs, light-emitting diodes, laser diodes, or any other source that emits radiant energy in one or more of the visible, ultra-violet, or infra-red spectrums. When an infrared light source is used, the or each photosensor may include a daylight filter" (paragraph 60).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to replace the light source of Saito with the claimed light source. The

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motivation for doing so would have been to provide a lower cost light source, which does not require an energy source for illumination.

Regarding claim 11, Saito discloses, "When the ink level 27 (ink level 26) is above the transparent windows 30, 31, the light ray C will pass through the ink (e.g., black ink), resulting in a smaller quantity of light reaching the phototransistor (light receiving means) 35" (Column 5, lines 32-47). Applicant's claimed invention specifies that when the container is not empty, the sensor cannot detect any light passing through the ink. Saito teaches that a certain amount of light is needed to trigger the phototransistor. Therefore, Saito renders obvious the claimed invention, since light needed to trigger the phototransistor is equivalent to the claimed "detecting" mechanism.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 5,689,290), as applied to claim 7 above, and further in view of Denton et al. (US 6,293,143).

With respect to claim 8, Saito, as modified, does not disclose a controller controlling operations of the inkjet printer and outputting a signal indicative that the level of ink is lower than the predetermined level to an output device.

With respect to claim 9, Saito, as modified, does not disclose a the output device comprises a display.

Denton discloses "a digital signal is generated as a result of the output change and is relayed to the printer control to signal a low ink level alarm. The alarm may be an audible signal, a visible signal, a message displayed on a computer monitor or a

combination of signals and/or messages. In the alternative, the digital signal generated by the photosensor 38 may also be used to terminate printing operations upon activation of the low level alarm" (column 4, lines 56-65).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have provided Saito, as modified, with the display indications for low ink level. The motivation for doing so would have been to easily alert a user of the printer when the liquid level within the ink tank is low.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Locher et al. (US 6,554,381) discloses an apparatus for measuring the level of liquid with a supporting member (Fig.1, element 8) located at the bottom of the ink cartridge (Fig.1, element 1).

Nagatomo (JP408300679A) discloses an ink jet cartridge (Fig.2, element 101) with a recessed cylinder (Fig.2, element 202) of which the bottom surface is coated with a luminous paint (Fig.2, element 201).

Kyogoku et al. (US 4,415,886) discloses prior art where a residual ink level detection mechanism uses opaque ink.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is (571) 272-2810. The examiner can normally be reached on 7am - 330pm.

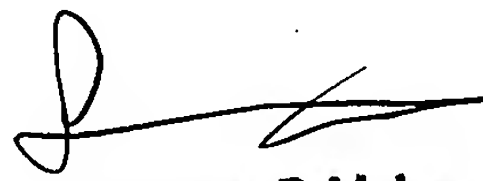
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Stephen D. Meier
Primary Examiner